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In-situ atmospheric measurement and comparison with satellite retrieval of column CO2 and CH4 mole fractions

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The IPCC expert meeting on Uncertainty and Validation of Emission Inventories was held in Utrecht, the Netherlands from 23 to 25 March 2010. The meeting discussed the use of the uncertainty guidance in the IPCC Guidelines, and ambient measurements systems (e.g. satellite, aircraft, flux towers, ground based measurements etc.) for the validation and verification of emission inventories. While remote sensing, ambient measurement and inverse modeling techniques have been successfully demonstrated they are currently not sufficiently developed to provide a comprehensive routine verification at the desired accuracy, much is to be gained from working together, to improve network coverage and verification techniques as well as to gain better understanding of inventory estimates. Thus, the use of satellite retrieval of column mole fractions of CO2 and CH4, forward transport simulations of inventory-based (bottom-up) and inverse model (top-down) flux estimations should be conducted and validated against independent observations, as and when available. How existing techniques using remote sensing and ambient data could be used to validate or assist inventory compilers, either now or in the foreseeable future, should be considered. To initiate a unified Chinese atmospheric greenhouse gases observing system and well integrate into the global network, the China Meteorological Administration (CMA) work with international institutions through intensive cooperation especially under the World Meteorological Organization Global Atmosphere Watch (WMO/GAW) framework. The ground-based greenhouse gases observing stations in China (Waliguan, 36.29ºN, 100.90ºE, 3816m asl; Shangdianzi, 40.39ºN, 117.07ºE, 293.9m asl; Lin'an, 30.3ºN, 119.73ºE, 138m asl; Longfengshan, 44.73ºN, 127.6ºE, 310m asl; Xianggelila, 27.5°N, 99°E, 3580m asl) were established and well calibrated relative to the international standard scale, which is necessary for integrated database and for making proper use of the data.